VOLUME 3 GENERAL TECHNICAL ADMINISTRATION

CHAPTER 30 EMERGENCY EVACUATION AND DITCHING DEMONSTRATIONS

Section 3 Safety Assurance System: Aborted Takeoff Demonstration Procedures

3-2506 THE DEMONSTRATION TEAM. The Federal Aviation Administration (FAA) team responsible for evaluating the emergency evacuation demonstration shall be headed by a team leader (TL). For an initial certification, the certification project manager (CPM) serves as the demonstration TL. When a demonstration is conducted by an existing operator, the district Office Manager (OM) will normally assign one of the operator's principal inspectors (PI) to serve as the demonstration TL. Every effort should be made to have cabin safety inspectors (CSI) act as TLs for the emergency evacuation and ditching demonstration or at least be involved in the planning and conducting of evacuation and ditching demonstrations. This may not always be possible because of the workload of some CSIs. When a CSI is not available, seek assistance from other experienced inspectors. Assign the TL as early as possible in the process, and no later than the beginning of phase three. The TL is responsible for planning, conducting, and evaluating the emergency evacuation demonstration. He/She serves as the focal point and central spokesperson for the FAA on all matters pertaining to the demonstration. Assign other members of the FAA team as needed and ensure these members consist of operations, cabin safety, maintenance, and avionics inspectors familiar with Title 14 of the Code of Federal Regulations (14 CFR) part 121 or 125 operations and applicable regulatory requirements. This section is related to Safety Assurance System (SAS) Element 5.1.1 (OP), Training of Flight Attendants, and Subsystem 5.2, Cabin Operations (M).

3-2507 PREDEMONSTRATION MEETING WITH OPERATOR. After reviewing and thoroughly evaluating the operator's plan (phase three), the FAA TL should meet with the operator's evacuation demonstration coordinator. During this meeting the FAA TL should accomplish the following:

- Review the operator's plan and ensure that he/she is thoroughly familiar with the applicable criteria to be used during the demonstration.
- Ensure that the operator is aware of its responsibilities regarding participant safety including provisions for safety observers, stands, ramps, padding, and ambulance coordination, as applicable.
- Review the method and signals for initiating the demonstration and timing criteria.
- In coordination with the operator, determine the signal to be used to terminate the demonstration such as an air horn, or some other clear, distinguishable audible signal. (Experience has demonstrated that a whistle blast may not be adequate.) A suitable device should be agreed upon as early as possible in the planning stage, and tested to assure its adequacy.
- Resolve any unanswered questions or issues the operator may have before conducting the demonstration.

3-2508 FAA TEAM PLANNING. The FAA TL must conduct a meeting with FAA team members to assure each team member has a specific assignment during the demonstration. This includes timekeeping, position (inside or outside the airplane), and inspecting the emergency

equipment, the airplane, and any applicable documents. The TL should distribute an aircraft diagram to each inspector showing their assigned locations for the demonstration. The team must determine which emergency exits shall be opened and which other exits will be blocked.

3-2509 CREW CRITERIA. Select "typical" crewmembers to be used in the demonstration from the list provided by the operator. Normally, typical crewmembers should not include emergency procedures instructors, supervisors, check airmen, union safety representatives, or others who may have an above average level of experience or exposure to emergency evacuation requirements. The qualifications of the crewmembers used in the evacuation demonstrations should be consistent with qualifications of line crewmembers. Normally, crewmembers used in these demonstrations should have been "line crewmembers" for the last two years. In addition, whenever possible crewmembers should not have been used in a demonstration within the last six months. There are smaller airlines where this may not be possible. When this is the case; document and include the former experience in the report regarding the demonstration. When the FAA determines that crewmembers to be used in the evacuation demonstrations have been allowed to "practice" opening the doors/exits, they should not allow these crewmembers to be used in the evacuation demonstration, unless the operator's FAA-approved training program includes this additional training. "Practice" is any training conducted outside of normally scheduled training programs.

A. The air carrier should present a minimum of two complete crews for the demonstration(s). During the consultation with the Regional Office (RO) and the Air Transportation Division (AFS-200) or the General Aviation and Commercial Division (AFS-800), as appropriate, through the certificate-holding district office (CHDO) that is required as a result of two demonstration failures, the lack of trained crewmembers for future demonstrations should be discussed. It is possible that in the case of equipment failures that are not related to airline training or procedures, such as a slide that failed to inflate due to an equipment malfunction. This determination should be coordinated by the principal operations inspector (POI) with the RO, through the CHDO.

B. It is very important that the "back-up" crewmembers that may be used if the first demonstration fails are not given any information about the first demonstration. Sometimes this is best accomplished by having these crewmembers isolated in an area which is physically removed from the first evacuation demonstration. However, when these back-up crewmembers are not held in an area away from the demonstration, they should stay in a group with an FAA inspector present so the inspector can ensure they are not given any information about the first demonstration.

C. When an airline is new, typical line crewmembers may not be available. When this is the case, the carrier must train the first cadre of flight attendants (F/A); it is quite possible that these F/As will also be instructors. Nevertheless, they should not be given instruction or experience that will not be given to F/As who will be expected to serve as F/As on this aircraft on the line. For example, they should not have had "train the trainer" training until after their participation in the evacuation demonstration. Chief F/As or F/A managers who are in charge of the air carriers over all F/A programs should not be used as crewmembers during evacuation and ditching demonstrations, unless no other F/As have been hired.

D. The FAA encourages whenever possible the use of separate crewmembers for the emergency evacuation demonstration and the ditching demonstration. Some new entrant air carriers may not be aware of the stress level the crews are facing by participating in these types of demonstrations. Additionally, by providing separate crewmembers for each demonstration, it provides the FAA with a better assessment of the training program. In the event of a non-F/A demonstration failure (e.g., equipment failure), it is recommended that a new F/A crew be selected from the remaining F/A group.

E. The TL must make certain each team member is aware of the signal to be used to initiate the demonstration and the signal to be used to terminate the demonstration. During the FAA meeting, review regulatory requirements and demonstration criteria to assure common understandings.

3-2510 SELECTING EXITS.

A. The TL should evaluate the air carrier's procedures when determining the exits to be used and blocked. Fifty percent of the required floor level exits must be opened and the slides or slide/rafts ready for use within 15 seconds. The remaining exits must be blocked. If emergency evacuation procedures dictate that F/As are assigned to open non-floor level exits as part of the F/A duties, these exits must be opened as part of the demonstration within the same 15 seconds. These floor-level exits (doors) and non-floor-level exits (windows or plugs) may be used provided they are designated as exits to be opened by a F/A in the company's evacuation procedures. Ventral (stairs) and tail cone exits should not be used unless they are paired with another exit. If there is any doubt as to which exits are paired, consult the Aircraft Certification Office (ACO) responsible for the type certificate (TC) of the aircraft make/model. In airplanes having an even number of exits, not more than 50 percent of the total number of exits and slides may be opened and deployed. When an airplane has an odd number of emergency exits a careful determination should be made before subtracting or adding exits. The exits which are used in the demonstration do not have to be part of an exit pair. TLs in charge of the evacuation demonstration should consult with the CHDO and with AFS-200 before making a determination of adding or subtracting an exit.

B. Any emergency exit assigned to a F/A as part of his or her evacuation duties may be selected for use during the evacuation demonstration. For the purpose of this document, a primary exit is one that is assigned to a F/A as the first exit he/she is assigned to open in the event of an emergency. A secondary exit is the next exit to which a F/A is assigned. For example, a F/A manual stipulates that a F/A sitting next to the floor-level exit at L1 would open that exit and then proceed to the floor-level exit at R1 and open that exit. When this is the case, the primary exit is the L1 door and the secondary exit is the door at R1. If the first exit is blocked then the F/A would proceed to the secondary exit and open it and then inflate the slide or slide/raft. When the F/A opens the first exit, the only actions required at the second floor-level exit (secondary exit) are to assess conditions and to redirect passengers away from the unusable exit. Then the F/A should return to the usable exit and command passengers out of the usable exit.

C. The TL must carefully review the operator's emergency evacuation procedures. When deciding which doors or exits are to be opened during a partial demonstration, the FAA

must not select a door that is not designated as a primary F/A duty to open, or a secondary door or exit that could not possibly be opened and the slide or slide/raft, if applicable, be ready for use in 15 seconds. For example, if a F/A operated his or her assigned floor-level exit and then proceeded to open an overwing exit, that would be considered unrealistic to accomplish operating both types of exits and still meet the 15-second time limit. However, it would be reasonable, at the conclusion of the timed portion of the emergency evacuation demonstration, for a F/A to operate the overwing exit to test the validity of their training as well as the mechanical reliability of the exit. For example, some aircraft are equipped with slides that deploy from the overwing exit. This is an opportunity to ensure the exit operates properly and the slide deploys per manufacturer's specifications. If the overwing exit or the slide failed to operate in accordance with manufacturer's specifications, it would not result in a failure of the emergency evacuation demonstration, but rather the failure would need to be addressed with air carrier personnel and appropriate action taken. Traditionally, one floor-level exit from each exit pair was selected to be demonstrated. While this is still an acceptable method, other exit combination possibilities exist and should be considered. For example, if an aircraft is configured with four F/A jump seats adjacent to the four floor-level exits, it would be permissible to have one exit pair blocked and the other exit pair be demonstrated. This type of combination would meet the requirement of opening 50 percent of the exits. Past precedence has discouraged one F/A from operating two floor-level exits due to the 15-second time constraint; however, this does not exclude or prohibit the TL from selecting both exits within the pair to be opened and the slides or slide/rafts deployed. The TL should use good judgment if this option is selected. Careful consideration to the air carrier's evacuation procedures must be thoroughly evaluated if this option is to be used. This decision should be coordinated with AFS-200. The operator should identify exit pairs in the interior configuration diagram. After determining which exits will be used, the team should not divulge that information to the operator.

3-2511 BLOCKING EXITS. The operator should propose the method for blocking exits. The demonstration team must review the proposal to determine its acceptability. The method that is selected for blocking of exits must require F/As to assess the exit.

A. The following are examples of acceptable methods of blocking exits during an emergency evacuation demonstration:

1) To simulate a fire at blocked exits, secure a chemical luminary/cylume stick (glow stick) to the exterior of each exit so that it is visible to a F/A who is assessing the exit. At the initiation signal, designated inspectors will pull lines attached to the glow sticks to remove them from the exits which are to be used and leave the glow sticks on the exits which are not to be used.

2) Secure red lights to the exterior of each exit so that when illuminated, they are visible to a F/A who is assessing the exit. At the initiation signal, the lights at exits which are not to be used will be illuminated to simulate fire at blocked exits.

3) Secure a visual indicator to the interior side of each exit. Prior to the demonstration, determine what conditions/visual signals the F/As will see during their assessment of the exit that will indicate that the exit is blocked or usable. The method selected

must ensure that F/As have no indication of which exits will be blocked and which exits will be usable, prior to the initiation signal.

4) Position a flashlight on the exterior of each exit so that when it is illuminated, it is visible to a F/A who is assessing the exit. At the initiation signal, designated inspectors will illuminate the flashlights to simulate fire at the exits which are not to be used.

B. When a method of blocking exits has been determined, the FAA TL must notify the company's project coordinator of FAA concurrence with the method and ensure the company will provide the required maintenance and logistical support to prepare the exit blocking methods.

C. The crewmembers should see the blocking signal on the aircraft in the same ambient conditions that will be present during the demonstration. This could be in addition to a video, a photo, or a demonstration of the signal in a briefing room. It is very important that the F/As have the opportunity to see exactly what they will be seeing on the aircraft during the evacuation demonstration.

3-2512 INITIATION SIGNAL.

A. Timing of the emergency evacuation demonstration is very important. Fifteen seconds is allowed for the completion of a successful demonstration. Fifty percent of the floor level exits must be opened within 15 seconds and the slide or slide rafts are ready for use. The timing should start at a prearranged signal. The signal should be agreed upon by the FAA and the operator. It is essential that FAA team members be aware of the demonstration initiation signal. The operator should propose a method which provides the same initiation signal for participants inside the airplane and FAA team members outside the airplane. The preferred method is for a company employee to interrupt the airplane's normal source of power by one of the following actions:

- Disconnecting or turning off an external source of power or a ground power unit (GPU),
- Disconnecting or turning off the auxiliary power unit (APU), or
- Power interruption from the cockpit.

B. This method of initiating the demonstration provides a clear initiation signal in the following ways:

- Inside the airplane, the F/As and FAA team members will observe the normal cabin lighting extinguish followed by the illumination of the emergency lighting system as their signal to commence the evacuation demonstration. It should be noted that these are not simultaneous events and there could be a second or two delay between the cabin lights extinguishing and the illumination of the emergency lighting system. For timing purposes, the demonstration commences when the cabin lights are extinguished.
- Outside the airplane, FAA observers (stationed at each exit) and the TL (who serves as the timekeeper) will observe the external lights (for example, taxi lights,

anti-collision lights, position lights, and logo lights) extinguish. This is the signal to initiate the timing and other necessary observation actions of the FAA team.

- The timing stops when that exit and slide or slide raft is ready for use.
- Timing for slide readiness should be done from outside the aircraft and stops when the slide or slide/raft is ready for use.
- Timing for stair readiness should be done from outside the aircraft and should stop when the stairs are fully extended and the bottom is within six inches of the ground.
- Timing of exits not equipped with an escape means is often done better from the inside of the airplane. The operator must follow their procedures as provided in the appropriate parts of the manual. The inspector should insure that the exit is ready for use and then stop the timing.
- The timing stops for evacuation demonstration when the designated exits have been opened and the slides or slide/rafts are ready for use.

C. When there is no crewmember assignment to open an exit, the TL may still require a crewmember (either a F/A or a flight deck crewmember) to open these exits; however this should be not be part of the timed evacuation demonstration. This is one method of determining that the operator's training and procedures are adequate for the airplane and are consistent with the intent of part 121, § 121.291 or part 125, § 125.189. This requirement could be needed when the aircraft is equipped with stairs, gull wings, overwing exits with slides, tailcones, or when the opening mechanism is new. The TL could establish a time limit for opening these "unassigned" exits.

D. Ensure the crewmembers are briefed and aware of the initiation and blocking signals. It is recommended the crewmembers see and/or hear the initiation signal and the exit blocked signal on the aircraft in the same ambient conditions that will be present during the emergency evacuation demonstration. It is particularly important for the F/As to be familiar with the blocking signals. The blocking signal must be clear, specific, and unambiguous and placed in the same location and position as they will find during the evacuation demonstration. It would be permissible for F/As to assess their exits for familiarity with the blocking signal.

3-2513 PARTICIPANTS. Due to the complexity involved in conducting an emergency evacuation demonstration, only those individuals who have a genuine need or concern should be present during the demonstration. Examples of persons who have a genuine need or concern would be representatives from the air carrier's training department, aircraft manufacturer, or slide manufacturer. Interested but unessential personnel may present hazards, interfere, or in other ways affect the outcome of the demonstration.

A. The operator is responsible for all non-FAA personnel who observe the demonstration. Those not directly involved in the demonstration should be kept at a reasonable distance from the airplane by some means such as ropes or lines.

B. The FAA TL is responsible for FAA personnel who observe the demonstration. FAA observers should be limited to those who are required to evaluate the conduct of the demonstrations or need to be involved for specific reasons such as the following:

- FAA inspectors from other offices whose operators will be acquiring the same or similar type aircraft as the one being demonstrated;
- FAA inspectors completing on-the-job-training (OJT) (The CHDO is encouraged to communicate its up-coming certification activities to allow other FAA inspectors to observe the demonstration for completion of OJT.);
- Regional or headquarters (HQ) officials or designees; or
- FAA personnel from the Certification Directorate, the Flight Operations Evaluation Board (FOEB), the Aircraft Evaluation Group (AEG), or any other FAA office concerned with technical or engineering components of the aircraft.

3-2514 PREDEMONSTRATION INSPECTION. Before the demonstration, the FAA team must inspect the airplane, emergency and safety equipment. The airplane must be configured and equipped for takeoff in accordance with the operator's manuals and procedures. The airplane must be configured in the proposed full passenger seating configuration with all appropriate emergency and safety equipment installed. The team must inspect each of the following items to ensure regulatory compliance:

- Hand fire extinguishers for crew, passenger, and cargo compartments (part 121, § 121.309(b) and (c));
- Protective Breathing Equipment (PBE) (§ 121.337);
- First aid equipment (§ 121.309(b) and 121.803);
- Crash ax (§ 121.309(b) and (e));
- Megaphones (§ 121.309(b) and (f));
- Interior emergency exit markings (§ 121.310(b));
- Flotation devices or life preservers (§ 121.339(a)(1), § 121.309(b), and § 121.340);
- Lighting for interior emergency exit markings (§ 121.310 (c));
- Emergency light operation (§ 121.310(d));
- Emergency exit operating handles (§ 121.310(e));
- Emergency exit access (§ 121.310(f));
- Exterior exit markings (§ 121.310(g));
- Exterior emergency lighting and escape route (§ 121.310(h));
- Floor level exits (§ 121.310(i));
- Additional emergency exits (§ 121.310(j));
- Ventral or tail cone exits (§ 121.310(k));
- Portable lights (§ 121.310(l));
- Seats, safety belts, and shoulder harnesses (§ 121.311(a), (c), (e), and (f));
- Emergency equipment required for extended overwater operations (§ 121.309(b) and § 121.339);
- Public address (PA) system (§ 121.318);
- Passenger information signs/placards (§ 121.317);
- Airplane fire detection and protection system (operational test);
- Passenger information cards (§ 121.571(b));
- Cockpit escape system (14 CFR part 25 § 25.810); and
- Slides and slide rafts (§ 121.309(b) and § 121.310(a)).

FYI: For the purpose of a partial evacuation demonstration only, the slides may be beyond scheduled inspection criteria. However, the operator must request this option in the demonstration plan and state that the operator accepts full responsibility for any failure of the demonstration due to a malfunction of the slides. The FAA will have the option to either accept or deny this proposal.

3-2515 PREDEMONSTRATION BRIEFINGS. Before the actual demonstration, a separate briefing should be conducted for each of the following participants:

- Crewmembers involved in the demonstration,
- Passenger participants (if applicable), and
- The FAA team.

A. The company's evacuation demonstration coordinator should provide crewmembers with certain information regarding the demonstration. The coordinator should brief the participants on key objectives and aspects of the exercise including but not limited to a clear understanding of the artificial nature of the exercise. The FAA TL must attend this briefing to resolve any questions to ensure the following information is included:

1) The purpose of the demonstration is to evaluate the following:

- The effectiveness of the company's training program as reflected by the crewmembers' actions,
- The adequacy of the company's emergency procedures, and
- The effectiveness and reliability of the airplane emergency equipment.

2) The initiation signal which begins the demonstration must be clearly specified. Ensure the crewmembers are briefed and aware of the initiation and blocking signals. It is recommended the crewmembers see and/or hear the initiation signal and the exit blocked signal on the aircraft in the same ambient conditions that will be present during the emergency evacuation demonstration. It is particularly important for the F/As to be familiar with the blocking signals. The blocking signal must be clear, specific, unambiguous and placed in the same location and position as they will find during the evacuation demonstration. It would be permissible for F/As to assess their exits for familiarity with the blocking signal.

3) The significance of the 90-second time limit (for full-scale evacuations) or the 15-second time limit (for partial evacuations), as appropriate, should be discussed.

4) The signal to be used by the FAA TL for terminating (stopping) the demonstration such as an air horn, or some other clear audible means should be described. Any evacuation activity in progress must immediately cease with a "stop" signal.

5) The importance of safety during the demonstration including crewmember responsibilities, safety observer duties, and limitations should be emphasized.

B. The FAA TL shall brief the FAA team as follows:

- State the objectives of the demonstration.
- Review the initiation signal.
- Review observer assignments with regard to exits to be used or blocked.
- Review the signal which stops the demonstration.
- Remind the team members not to discuss the results of their observations with persons other than the TL.

3-2516 CONDUCTING THE DEMONSTRATION.

A. The TL shall ensure all predemonstration briefings and inspections are conducted before the actual demonstration. The following sequence of events represents an acceptable means, derived from past experience, for conducting the demonstration.

B. For both full-scale and partial demonstrations F/As will accomplish the following:

1) Prepare for a normal departure in accordance with the operator's procedures, including closing and securing all exits, galleys, and arming the emergency evacuation system for takeoff.

2) Conduct a passenger briefing in accordance with § 121.571 or § 125.327 and the company's procedures.

3) Be seated at their assigned positions with their restraint systems fastened.

4) The FAA team then ensures that each external door and exit, and each internal door or curtain is in position for a normal takeoff.

C. Before the initiation signal, the flightcrew shall accomplish all tasks on appropriate checklists and configure the airplane for a normal takeoff. The flightcrew must be seated in their normal positions with their restraint systems fastened.

D. After completing all required pre-takeoff actions, the captain shall inform the FAA TL (who is positioned forward of the nose of the aircraft), by ground interphone, that the aircraft is ready for takeoff.

E. Once the FAA TL has been told that the crew is ready, he/she must make certain all FAA team members and company safety observers (if used) are ready and in position. The TL will then issue a warning signal (air horn or whistle blast) which should precede the initiation signal by approximately 30 seconds. Depending upon the method approved by the FAA (as in the operator's plan) the TL shall inform the company evacuation demonstration coordinator to initiate the demonstration.

F. The FAA TL will coordinate the timekeeping with two stopwatches (a primary and a back-up). The timing will begin when the external airplane lights extinguish. The timing will end when all selected exits/slides or slide/rafts are ready for use. At the end of the appropriate time period (90 or 15 seconds, as appropriate) the TL shall issue a clear, audible signal terminating the demonstration.

G. For a full-scale demonstration, each FAA observer assigned to exits which are to be used must count the number of passenger participants as they exit the airplane. After the termination signal, each observer shall determine that no other participating passenger or crewmember remains on board the airplane or use the exits. Any participating passengers or crewmembers remaining on board or using an exit or a slide (evacuation device) after the termination signal constitutes an unsatisfactory demonstration.

H. For a partial demonstration, each FAA observer assigned to exits which are to be used is responsible for determining that his/her assigned exit was opened and each slide or slide raft (as applicable) was ready for use before the TL's termination signal. Any exit, slide, or slide raft that was not ready for use before the termination signal constitutes an unsatisfactory demonstration.

I. The FAA team members assigned to the cabin shall ensure that all required equipment worked properly (for example, floor proximity (PROX) lighting, emergency exit lights).

J. It is important that team members do not discuss the results of their observations with company personnel or passenger participants. After the demonstration has been terminated, the FAA team shall confer immediately on the observation of each team member and the overall conduct of the demonstration before advising the operator of the demonstration results.

Figure 3-113. Full-Scale Demonstration

FYI: Stands or ramps may be appropriately placed for use by evacuees to descend from the wing to the ground (part 121 appendix D (a)(3) or part 125 appendix B(a)(3)). They should be inspected for structural integrity and security. Other safety equipment such as mats may be placed on the ground to protect participants in reaching the ground. If stands or ramps are to be used, they must be appropriately placed at both overwing exits because at the time of their placement the company will not know which exits will be used or blocked.

FULL-SCALE DEMONSTRATION

B._ The company's evacuation demonstration coordinator should provide passenger participants with the following information before the demonstration:

(1)_ The purpose of the demonstration is to evaluate how quickly the aircraft can be safely evacuated.
(2)_ Passenger participants must be attentive to the flight attendant's instructions.
(3)_ Individual safety is not to be compromised at any time during the demonstration.

FULL-SCALE EVACUATION DEMONSTRATION

B._ The team leader will advise the operator to board the passengers, as routinely as possible, and prepare for departure. No passenger may be assigned a specific seat unless the FAA team determines such assignments are in accordance with the operator's normal boarding procedures.

FULL-SCALE DEMONSTRATION

D._ When the preceding actions are completed, the FAA team will accomplish the following:

(1)_ Will place a reasonable amount of carry-on baggage, blankets, pillows, and items of clothing in the aisles and emergency exit access ways to create minor obstructions. Carry-on luggage such as small suitcases, gym bags, airplane flight bags, and briefcases should be placed in the main aisles with one bag per seat row for each aisle. Also, some bags should be placed in the aisles and passageways, and pillows and blankets should be scattered in the main aisles.

FULL-SCALE DEMONSTRATION

NOTE: If the operator's emergency evacuation procedures require the wing flaps to be placed in the fully extended position, the airplane will be so configured before the demonstration and the stands or ramps (if used) positioned. The wing flaps must not be repositioned until after the demonstration.

RESERVED. Paragraphs 3-2517 through 3-2530.